

Capy 32A # 1807

Contract W-7406 eng-39

Metallurgical Project

A. H. Compton, Project Director

DECLASSIED Per Letter Instructions Of AEC 4-21-54

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PARTIAL

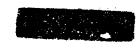
WONTHLY REPORT FOR THE FERIOD ENDING DECEMBER 31, 1944

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Received Clinton: 1/13/45

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Physics Section I

Total technical personnel (including supervision)...... 18 (this period)

Problem Assignment		P	Percentage o	ercentage of Section Manpower	
Number	Subject	Status	Report Por.	Next Per,	
131-x21P 105-x24P 307-x29P 307-x31P 105-x34P 105-x35P 303-x35P 108-x36P 103-x37P	Bismuth Foils Cl4 Neutron Diffraction H3 Bel0 Xel35 Water Lattices Pile Modulation Temperature Coefficient	Active Active Active Active Inactive Inactive Active Active Active Active	7 10 17 6 0 0	6 8 3 0 2 2 3 0 5	
106- x 38P 163- x 30P	Neutron Distribution Service Flux Measure	Inactive	O	r.	
105-x40P 104-x42P 307-x459	Test Neutron Yields Negative Pile Periods Gammas of Lalu, Taloz, Sbl24	Active Active Innctive	6 6		
	40	Active	10	A P. P.	
		Total	. 100	100	





105-X24P - Cl4 Production - (Meiners, Norris, Snell)

The C¹⁴ factory as described in last month's report was inserted in hole 16 of the pile, and it was filled with pure water for purposes of preliminary tests. The circulating and safety systems worked well, with the exception that the dumping (which is designed to take place if circulation fails or temperatures gets too high) was incomplete; much of the liquid remained in the tube in the pile. In addition, the neutron absorption due to the water was higher than expected; it amounted to about 100 inhours. These two factors seemed to make it desirable to redesign the tube in hole 16, and it was pulled out and replaced. The new tube is a \$\mathbb{U}\$ of two \$\mathbb{W}\$ tubes side by side in a \$\mathbb{U}\$" safety tube. At the north end (i.e. the entrance and exit end) one branch of the \$\mathbb{U}\$ is above the other, while at the south end the bend of the \$\mathcal{U}\$ lies in a horizontal plane. Thus the lower north end is a definite low point of the system, and drainage will be complete if done from this point.

We are indebted to \$\mathbb{W}\$r. Borst for the suggestion of this design. The volume of this system is about 1/3 of that of the old tube.

This new factory has just been installed. Filling it with tap water caused a loss of 45 inhours in the reactivity of the pile. The addition of ammonium nitrate to make a saturated solution at 20°C will about double this. At the moment of writing it appears that there is not sufficient excess reactivity available in the pile to carry this load. A further loading of at least 3 tons of metal or about 45 stringers is required to permit the manufacture of the C¹⁴ to the full capacity of our factory, with a small margin of excess k for operational exigencies. No C¹⁴ at all can be made until at least some new metal is loaded.



105-X22P - Search for U²³⁶ - (Borst, Curtiss, Jenks)

A sample of ordinary uranium irradiated and concentrated by a Szilard-Chalmers process by Jenks was examined at the National Bureau of Standards in an apparatus for measuring the distribution of the ranges of the alpha particles. Unfortunately this sample contained a large amount of ordinary uranium as the result of incomplete separation. However, a comparison of the alpha ray curve for this sample with that of uranium which had not been irradiated reveals a small percentage of alpha rays at a range of approximately 2.8 cm, which is not present in the ordinary material used as a control. This result indicates that it is advisable to continue these experiments with improved technique to establish definitely the reality of this alpha ray group and determine its range.

307-X31P - Production of Tritium - (Borst, Osborne)

Studies on the recovery of tritium from a Li-Pb alloy have been terminated. At the time the work was dropped, we had succeeded only in recovering a small percentage of the tritium produced in the slug. About 9.1 cc of pure hydrogen gas was obtained containing approximately 20% H³. The amount estimated to have been formed was 0.8 cc. The gas was recovered during the heating of the slug between 500 and 600° C. No appreciable amount was obtained above this temperature.

Nore suitable methods of preparation are being developed by Camnon and Shapiro of the Chemistry Division.

307-X29P - Neutron Diffraction - (Floyd, Hasbrouck, Ulrich)

Enstrument development has claimed the principle attention of the group. An apparatus of greater efficiency and higher resolution is being constructed.